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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,829	03/29/2004	Alan D. King	04-100	9996

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EXAMINER	
FERNANDEZ, SUSAN EMILY	
ART UNIT	PAPER NUMBER
1651	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/810,829	KING ET AL.	
	Examiner	Art Unit	
	Susan E. Fernandez	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25,26,28,29,31,38,40,44,47,49,50,52 and 53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25,26,28,29,31,38,40,44,47,49,50,52 and 53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 20, 2007, has been entered.

Claims 1-24, 27, 30, 32-37, 39, 41-43, 45, 46, 48, and 51 are cancelled.

Claims 25, 26, 28, 29, 31, 38, 40, 44, 47, 49, 50, 52, and 53 are pending and examined on the merits.

Claim Rejections - 35 USC § 103

Claims 25, 26, 28, 29, 31, 38, 40, 47, 49, 50, 52, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weidlich et al. (US 5,103,837) in view of Hofmann (U.S. 6,009,347) and further in view of Zewert et al. (U.S. 5,749,847) and/or Widera et al. (Journal of Immunology, 2000, 164: 4635-4640) and Wang et al. (US 6,063,259).

Weidlich et al. teaches an implantable, stimulating electrode which is coated with a hydrophilic polymer which comprises an anti-inflammatory steroid (claim 1). The anti-inflammatory steroid diffuses after implantation into surrounding tissue (claim 1). Though not expressly stated, it is clear that when the electrode is implanted, the steroid is delivered into biological cells in the tissues penetrated by the electrode by the electric field applied to the penetrated tissues. Thus, Weidlich et al. discloses limitations in instant claims 25, 29, 31, and 52.

Furthermore, the reference discloses the limitations in instant claim 49 (column 4, lines 1-7). Note further that instant claims 49 and 50 are product-by-process claims. M.P.E.P. § 2113 reads, "Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps."

"Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)

The use of 35 U.S.C. §§ 102 and 103 rejections for product-by-process claims has been approved by the courts. "[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based

alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972). Thus, Weidlich et al. may be applied to teach the limitations of claim 50 under examination.

Weidlich et al. differs from the claims in that electrodes are not expressly disclosed as being non-hollow needle electrodes.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have used non-hollow needle-like electrodes for preparing the Weidlich invention since needles are suitable means for injections in the body. Moreover, it would have permitted access to more deeply located cells in the body. As needles come in two known forms, hollow and non-hollow, it would have been obvious to a person of ordinary skill in the art to try these two forms, as a person with ordinary skill has good reason to pursue the known options within his or her technical grasp.

Additionally, Weidlich et al. does not expressly disclose an electrode assembly, or that the electrode assembly comprises of at least two parallel rows of electrodes.

Hofmann discusses electroporation for use in introducing foreign material into living cells (column 1, lines 9-14 and lines 34-40). Specifically, Hofmann discloses using needle electrodes (column 4, lines 33-35) and notes that "the applicant has found through experimentation that pulsing between multiple pairs of electrodes in a multiple electrode array, preferably set up in rectangular or square patterns, provides improved results over that of pulsing

between a pair of electrodes" (column 4, lines 49-53). The electroporation device may comprise of an array of needles as electrodes (column 4, lines 53-61).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have modified the Weidlich invention such that needle electrodes set up in electrode arrays of multiple rows of electrodes are used to create the stimulating electrodes of Weidlich et al. One of ordinary skill in the art would have been motivated to do this because electrode arrays result in improved drug delivery (Hofmann, column 4, lines 49-53). Furthermore, Hofmann indicates that needle-shaped electrodes allow for access to more deeply located cells (column 1, lines 44-45).

Additionally, Weidlich and Hofmann differ from the claimed invention in that they do not expressly disclose macromolecules such as vaccines, including polynucleotide, and DNA vaccines, in the polymeric coating of the implantable, stimulating electrode taught by Weidlich et al.

Zewert et al. teaches the use of electroporation for the delivery of nucleotides into an organism (column 2, lines10-14). More specifically, a composition comprising the nucleotide(s) is applied to the skin, and the skin is subsequently electroporated. The composition applied to the epidermis for drug delivery may include a vaccine (column 4, lines 32-34), and appropriate nucleotides for delivery include polynucleotides, deoxyribonucleotides (column 3, lines 44-46), and ribonucleic acid (column 4, lines 44-46).

Widera et al. discloses DNA vaccine delivery facilitated by electroporation (abstract). Needle array electrodes were used for electroporation following the injection of DNA or a DNA vaccine (page 4636, first column, "DNA immunization and in vivo electroporation").

Further still, Wang et al. teaches an electrode coated with nucleic acid, such as DNA (column 5, lines 6-12 and claims 1 and 12).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have included polynucleotide, DNA, and RNA vaccines in the polymeric coating of the Weidlich electrode to be delivered when applying an electric field. One of ordinary skill in the art would have been motivated to do this because the Weidlich invention involves delivery of a drug (anti-inflammatory steroid), offering a device which accomplishes in a single step the methods of Zewert et al. and procedures performed in Widera et al. Moreover, Widera et al. concludes that "in vivo electroporation substantially increases DNA delivery and DNA vaccine potency, appears to be well tolerated by the animals, and is a simple technique that takes only a few seconds after inoculation" (page 4640, second paragraph).

Thus, a holding of obviousness is required.

Claims 25, 26, 28, 29, 31, 38, 40, 44, 47, 49, 50, 52, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weidlich et al., Hofmann, Zewert et al., Widera et al., and Wang et al. as applied to claims 25, 26, 28, 29, 31, 38, 40, 47, 49, 50, 52, and 53 above, and further in view of Lerner (WO 97/18855).

As discussed above, Weidlich et al., Hofmann, Zewert et al., and Widera et al. render claims 25, 26, 28, 29, 31, 38, 40, 47, 49, 50, 52, and 53 obvious. However, these references do not expressly disclose protein-based vaccines in the polymeric coating of the implantable, stimulating electrode taught by Weidlich et al.

Lerner discloses a drug delivery device comprising electrodes supporting a "drug or other biologically active substance or compound" (claim 9). Furthermore, drugs or other biologically active substances for delivery include bacterial vaccines (page 28, line 7), proteins (page 28, line 19), and viral vaccines (page 28, line 22).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have included protein-based vaccines in the polymeric coating of the Weidlich electrode to be delivered when applying an electric field. One of ordinary skill in the art would have been motivated to do this because Lerner teaches that a variety of drugs can be delivered when using electrodes. It would have been desirable to deliver protein-based drugs for vaccination of bacterial and viral diseases. Moreover, since the Weidlich electrode is suitable for delivering a drug (anti-inflammatory steroid), one of ordinary skill in the art would have recognized the suitability of delivering other drugs in the same manner by including the drug in a coating on the electrode.

Thus, a holding of obviousness is clearly required.

Response to Arguments

Applicant's arguments filed April 20, 2007 have been fully considered but they are not persuasive. The applicant argues that the declaration under Rule 132 filed on April 20, 2007 demonstrates how the combination of Weidlich et al. and Hofmann is not proper and nonobvious. Further still, the applicant points out that Weidlich et al. teaches that only the steroid is delivered into the cells by diffusion, and that there is no teaching and no reason why the hydrophilic polymer coating of the Weidlich electrode would itself be delivered into the

cells. However, it is respectfully noted that as discussed above, in view of Zewert et al., Widera et al., and Wang et al., it would have been obvious to have substituted the steroid with macromolecules such as polynucleotide or protein vaccines, given that there would have been a reasonable expectation of success that such compounds would bind as a coating on the Weidlich electrodes. Moreover, Wang et al. provides an example of a teaching which shows that DNA can successfully serve as a coating for electrodes.

Further still, applicant notes that the steroid of Weidlich et al. is not delivered into the cells by the applied electric field, and is instead delivered by diffusion. This is also discussed in further detail in the declaration. However, it is noted that MPEP 2114 indicates that "While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function." Thus, the recited function of the delivery of macromolecules into biological cells by an applied electric field cannot be used to distinguish the claimed invention from the prior art applied in the rejections.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant discusses various features of the Hofmann invention, but it is respectfully noted that the Hofmann invention is applied because of its teachings regarding electrode assemblies, thus solely provided to give motivation to make such a modification in the Weidlich invention. Thus, the teachings of injection of a drug are not applied to the Weidlich invention.

With respect to Zewert et al., the applicant argues that "...once the nucleotide component is in the organism below the stratum corneum, the nucleotide component resides in the interstitial spaces between the cells of the organism and does not penetrate into the cells." However, the applicant has not cited this teaching in Zewert et al. Moreover, even if Zewert et al. indeed taught this, as noted in MPEP 2114, "While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function." The function of delivering macromolecules into biological cells in the tissue penetrated by the electrode cannot be used to distinguish the claimed apparatus from the prior art. Furthermore, the applicant attempts to distinguish Zewert et al. from the prior art by pointing out that Zewert et al. teaches sitting the electrodes on the surface of the stratum corneum, rather than penetrating the electrodes into tissues. However, MPEP 2114 also points out that "A claim containing a 'recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus' if the prior art apparatus teaches all the structural limitations of the claim." In this case, the combination of the references indeed teaches the structural limitations of the claims.

With respect to Widera et al., applicant notes that the reference (as well as the Hofmann reference) are in sharp contrast with the claimed invention since the claimed invention only requires two steps performed with two apparatuses, versus the three-step process with three apparatuses taught in Widera et al. and Hofmann. However, as pointed out above, Hofmann and Widera et al. are only combined with the primary reference to provide motivation for coating an electrode with macromolecules such as DNA vaccines.

Finally, with respect to Lerner, the applicant argues that the Lerner electrodes are not inserted into tissues and does not teach every aspect recited in the claims (non-hollow needle electrode, etc.). However, it is respectfully noted that Lerner is provided solely to give motivation for coating the electrodes of Weidlich et al. with protein-based vaccine.

Thus, a holding of obviousness is required.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan E. Fernandez whose telephone number is (571) 272-3444. The examiner can normally be reached on Mon-Fri 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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